

AUTOMATIC PERSONNEL LOWERING SYSTEM FOR HIGH-RISE BUILDINGS

CROSS REFERENCE TO THE RELATED APPLICATION

This application claims the benefit of U.S Provisional Patent Application Serial No. 60/447,278, filed February 14, 2003.

BACKGROUND OF THE INVENTION

This present invention relates to an automatic personnel-descending system to use in case of emergency jump-out situation from a high-rise building. The system is fully integrated and automatic, which is capable of sensing weight and adjust the descend speed accordingly, thereby providing same lowering speed regardless of the weight. The system is very portable and can be used for different purpose and can be set or tied to any strong furniture, fixture or otherwise attached to the weight using strap arrangement.

(ii)

DESCRIPTION OF RELATED ART

Several prior arts been examined, such as, Chiu et al. US 5,884,726, March 23, 1999, Tien US 5,842,542 Dec. 01, 1998, Mai US 5,590,740 Jan. 07, 1997 and Ishioka US 5,060,758 Oct. 29, 1991. These inventions have addressed the issue and have attempted to invent a system in order to address the emergency evacuation. However, none of this invention is close to the present invention in the form of functionality, design, performance or concept.

SUMMARY OF THE INVENTION

This automatic descending system for emergency evacuation from high-rise building is suitable for lowering human being from an adult to a child. This automatic system delivers the lowering load to a speed, which is automatically adjusted on continuous basis depending on the load. This rugged system is very portable and extremely handy. The cable retracts back to the elevation with a faster speed thereby help other person to follow down at a minimum time. The descending operation is controlled and very safe, due to this feature the impact with the ground is nominal. The operation of this unit is so simple that a kid can descend from a high-rise building in case of emergency in minutes.

(iii)

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 explains across section of the art showing components and component assemblies.

1. Casing
2. Coil Spring
3. Ball Bearings
4. Cable Spool
5. Cable
6. Primary Shaft
7. Intermediate Shaft
8. Clutch Shaft
9. Flywheel Gear
10. Set of Planetary Gears
11. Speed pinion
12. Unidirectional Clutch/Ratchet
13. Expandable clutch vanes/governors
14. Planetary arm
15. Fixed vanes hydraulic clutch
16. Translucent clutch assembly
17. Tie down assembly

(iv)

- 18. Hydraulic fluid for clutch
- 19. Fluid maintenance plug
- 20. Compression spring
- 21. Guide roller for cable
- 22. Hydraulic seals.

DETAIL DESCRIPTION OF PREFERRED EMBODIMENT

1. The present invention is a break through in safety devices for high-rise buildings for safety of lives in case of emergency evacuation. Figure 1 describes a portable unit, which can be attached to several different fixtures or a heavy piece of furniture in case of emergency. In some cases it can also be tied to the load itself. In a typical emergency situation this unit is tied down to any available stable furniture or fixture at the tie-down point (17).
2. This integrated portable descending system comprises of, but not limited to, a retractable cable (5), made of nylon, fiber or similar material, wound on a spool (4) enclosed in a casing (1). This spool (4) is arranged on a limited floating shaft (6) along with a compression spring (20) on one side and a unidirectional ratchet clutch or similar clutch (12) on the other side. The shaft (6) is attached to a long coil spring (2) for providing fast retraction of the cable once it is released. The shafts are fitted with ball bearings (3) for minimum friction. The cable is delivered over a guide roller (21).
3. This automatic descending system as described in figure 1 is integrated with a clutch (16), hydraulic or mechanical, the coupling of the cable spool (4) and the translucent clutch (16) is through a ratcheting clutch (12) attached to a intermediate shaft (7) which floats over the clutch shaft (8). All the shafts are

supported with ball bearings (3) and seals (22). This unidirectional coupling or clutch (12) engages the translucent clutch (16) only during the pull out of cable. During this controlled pull out, the other side winds a long coil spring (2) over the shaft. As the cable is released the spool disengages itself from the clutch (12) therefore allowing the cable to retract faster.

4. This automatic controlled lowering system can be very useful safety device for emergency jump out from the high-rise buildings in case of fire or other hazard. The load sensing hydraulic opr mechanical clutch (16) is coupled via a set of planetary gears (10) set under a flywheel gear (9) arranged in a manner over a pinion gear (11) attached via planetary arm (14) in order to provide increase rotation to the clutch shaft (8). The clutch is fitted with expandable vanes (13) or load governors in conjunction with fixed vanes (15) in order to provide increased resistance with increased load. In case of a hydraulic clutch, the clutch is provided with hydraulic fluid (18) and fluid maintenance plug (19).